The application programs, which are executed by the application component 182, are executed independently of selected user parameters. For example, an application program that is controlled by a user may, instead of containing a text element in a particular language, contain a resource identifier identifying a piece of information to be included at a particular location, for example, on a web page for display to the user. The resource identifier can be, for example, a string. The resource identifier is independent of the user and may be translated by the application component 182 into a particular language or format to be understood by the user in accordance with a selected user parameter. Thus, the application component 182 reads a resource identifier independently of a user parameter and initializes conversion of the resource identifier into resource data in accordance with the selected user parameter for presentation to the user.

The conversion of the resource identifier into resource data for presentation to the user is performed by the lookup component 183. The lookup component 183 calls a lookup function for obtaining resource data from a lookup object based on the read resource identifier. The lookup object links a plurality of resource identifiers and resource data in dependence on a selected user parameter.

Before the lookup component 183 accesses the lookup object for retrieving resource data based on a resource identifier and a user parameter, the lookup component 183 initializes the lookup object. The initialization of the lookup object can include, for example, reading a text file that contains the lookup object data and inserting the data into the lookup object. The initialization of the lookup object may be executed once upon establishing an application program session with a particular user or it may be initialized with each user request.

A plurality of lookup objects may be available, and may be loaded, for example, in dependence on requirements of an application program.

The lookup component 183 may receive, from the application component 182, a read resource identifier that identifies a resource to be presented to a user by the application, and may call a lookup function for obtaining from the lookup object resource data based on the received resource identifier.

The resource data to be presented to the user may comprise, for example, a text element of at least one character, such as a word in a particular language in

accordance with the selected user parameter. For example, the resource identifier could identify a resource text element "intellectual property" and, based on a user parameter that identifies the location of the user, the resource data presented to the user could be "Gewerblicher Rechtschutz" for a user in Germany, "Propriété Intellectuelle" for a user in France, or "Intellectual Property" for a user in the United States. Alternatively, the resource data may also be based on a user parameter that sets a language preference of the user.

Further, the resource data may include a resource function that includes rules for character representation, such as for facilitating presentation to a user of a date, a time, a currency or a floating point number.

For example, in a case where the current date is to be presented to a user, the application means 182 can call a resource function for obtaining the current date. Then, the application means 182 can use a resource function for converting the current date into a date format that is based on a user parameter that has been selected by the user. As an illustrative example, the current date "23rd of August, 2000" could be converted to "08/23/00" based on a user parameter that identifies the user's location as in the United States or based on another user parameter that has been selected by the user. In another example, based on a user parameter that identifies the user's location as in Germany, the current date could be converted to "23.08.00" using the resource function in dependence on the selected user parameter.

In a case where the resource data comprises a floating point number, a similar sequence of steps could be carried out. For example, when the application component 182 is to present the number "1.1" in a U.S. format, e.g. for a user in the United States having made an appropriate user parameter selection, the floating point number is presented to the user in the form of "1.1". For a user, for example in Germany, the application component 182 presents the floating point number to the user in the form "1,1". Similar conversions of resource identifiers into resource data could be performed in other cases, such as for presentation of currencies.

Accordingly, the above-described resource program 180 includes components for writing an application that is independent of a user environment

(i.e., of a selected user parameter) and for providing information for presentation to a user that is localized to the user. The application component 182 executes an application which is independent of a user environment and the lookup component 183 calls a lookup function for inserting localized resource data, for example into a frame containing information to be presented to the user.

Furthermore, data that is locally inputted by a user in a particular format, such as a date or and time format, can be converted into a format independent of a user parameter by using resource functions. For example, a user, who is located in Germany and who's location is identified as Germany based on a user parameter selection, inputs the floating point number "1,1". The application component 182 can convert the floating point number, using an appropriate resource function, into an internal format that is independent of the user parameter. That is, the application component 182 can convert the floating point number into the format "1.1".

A user can also select multiple user parameters. For example, a user can select a user parameter specifying language or format, as described above, and a user parameter specifying user other settings, such as characteristics of the display of a device operated by the user, such as a personal data assistant (PDA), a palm top computer, or mobile phone. A user parameter may also specify a user preference for the presentation of web pages, such as to generate customized web pages. For example, a user may wish to view the current time and date at a particular position on the video display of the data processing device or may wish a specific representation of a web page, such as to fit the information into a small screen of a mobile device.

To simultaneously support user parameters that specify languages, formats, and user settings, the resource program can include a plurality of lookup objects.

In brief, the described embodiment provides internationalization capability to applications that are written to be independent of a language or format desired by a particular user. Functions are provided that support localized text resources, that convert locally different user inputs such as date, time, and floating point representation into resource identifiers intended to store such data, that convert